

School of Engineering
Department of Computer Science and Engineering
End Semester Examinations 2021-2022 Even
Question Paper

Name of the Programme: Common to B.Tech AI & DS and CSE (IoT)	Semester: II
Course Code & Name: CS1002 PROGRAMMING IN PYTHON	
Regulations: Regulation 2021	
Time: 3 Hours	Maximum: 100 Marks

Q.No.	Questions	Marks	CO#	KL#
Part-A - Short Answer Type (8 × 5 = 40)				
1	Assume two lists: wordList = ['apple', 'orange', 'banana', 'fig'] charList = ['l', 'r'] Create a new list that contains only the words from wordlist that doesn't have any characters from the charList . o/p: ['banana', 'fig']. Write a program that works for any given input.	5	CO1	KL2
2	Write a Python program to reverse a string and check if it is a palindrome without using built-in functions and slicing operator.	5	CO2	KL2
3	Write a program which takes 2 digits, X and Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be filled with i x j . <i>Example:</i> Suppose the following inputs are given to the program: 3,5 Then, the output of the program should be: [[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]	5	CO1	KL2
4	Write a program to eliminate the duplicate values in a numeric sequence stored in a list, but preserve the order of the remaining items. The original list should be passed to a function named dedupe() , and the function then returns the updated list. For example, a = [1, 5, 2, 1, 9, 1, 5, 10] dedupe(a) should print [1, 5, 2, 9, 10] Hint: If you convert the original list into a set and then convert this set back to a list will remove duplicate values, but set containers do not preserve the order of the original list sequence. So, you must solve it without using set() .	5	CO2	KL3

5	<p>Given two complex numbers $z1 = a + bj$ and $z2 = c + dj$, write a Python program to perform <i>addition, subtraction, and multiplication</i>, and display the results. Each of these operations should be performed as function calls. Name the functions as <code>z_addition()</code>, <code>z_subtraction()</code>, and <code>z_multiplication()</code>. There will be two arguments to functions, <code>z1</code> and <code>z2</code>, and the function returns <code>z3</code> which is the result. This should be printed in the complex number format as a string. The complex number should be initialized as a string.</p> <p>For example, <code>z1 = "3 + 12j"</code>.</p> <p>Hint:</p> $(a + bj) + (c + dj) = (a+c) + (b+d)j$ $(a + bj) - (c + dj) = (a-c) + (b-d)j$ $(a + bj) \times (c + dj) = (ac - bd) + (ad + bc)j$	5	CO2	KL2
6	<p>CID Singaram always jumbles the text that he reads. Eg: He reads "noor mahal" as "roon laham". Create a Python program that reads a string sentence and swaps the first and last character of each word in the string and displays the result.</p>	5	CO2	KL2
7	<p>A robot moves in a plane starting from the original point (0, 0). The robot can move towards UP, DOWN, LEFT, and RIGHT with a given step. The trace of robot movement is shown as the following:</p> <p>UP 5 DOWN 3 LEFT 3 RIGHT 2</p> <p>The numbers after the direction are steps. Write a program to compute the distance from current position after a sequence of movement and original point. If the distance is a float, then just print the nearest integer.</p>	5	CO2	KL3
8	<p>Write a function <code>dict_merge_sum()</code> that takes two dictionaries <code>d1</code> and <code>d2</code> as parameters. The values of both dictionaries are numerical. The function should return the merged sum dictionary <code>m_dict</code> of those dictionaries. If a key <code>k</code> is both in <code>d1</code> and <code>d2</code>, the corresponding values will be added and included in the dictionary <code>m_dict</code>. If <code>k</code> is only contained in one of the dictionaries, the <code>k</code> and the corresponding value will be included in <code>m_dict</code> as is.</p>	5	CO2	KL3
Part-B - Long Answer Type (4 × 15 = 60)				
9	<p>a. What are exceptions and how are they handled in Python? Explain any five exceptions with a code snippet along with relevant comments.</p> <p>b. Write a Python program to read a file (assume the file is filled with some contents) and copy the contents to a new file. Write appropriate comments.</p>	15	CO3	KL3

10	<p>Hangman – Create a word list assuming that the characters of each word in the list are non-repeating. Randomly get a word from the above list and assign the same to a variable. The user should input a character and if that character is present in the word, the output should contain the character at the appropriate position. If the character is not present in the word, the attempt count should be decremented. The user should guess the word within 8 attempts failing which the game ends.</p> <p>For eg: let the input word be “python”</p> <ul style="list-style-type: none"> the user inputs ‘h’ the output should be _ _ _ h _ _ user inputs ‘t’ the output should be _ _ t h _ _ user inputs ‘r’ the output should be _ _ t h _ _ (attempt_count should be decremented) <p>Use functions to implement the above program.</p>	15	CO4	KL6
11	<p>Given is the following simplified data of a supermarket for online purchase:</p> <pre>supermarket = { "milk": {"quantity": 20, "price": 25.00}, "biscuits": {"quantity": 32, "price": 20.00}, "butter": {"quantity": 20, "price": 70.50}, "cheese": {"quantity": 15, "price": 82.50}, "bread": {"quantity": 15, "price": 45.00}, "cookies": {"quantity": 20, "price": 52.80}, "yogurt": {"quantity": 18, "price": 41.30}, "apples": {"quantity": 35, "price": 120.40}, "oranges": {"quantity": 40, "price": 60.50}, "bananas": {"quantity": 23, "price": 50.00} }</pre> <pre>customers = ["Frank", "Mary", "Paul"]</pre> <pre>shopping = { "Frank" : [('milk', 5), ('apples', 5), ('butter', 1), ('cookies', 1)],</pre> <pre> "Mary": [('apples', 2), ('cheese', 4), ('bread', 2), ('pears', 3), ('bananas', 4), ('oranges', 1), ('cherries', 4)],</pre> <pre> "Paul": [('biscuits', 2), ('apples', 3), ('yogurt', 2), ('pears', 1), ('butter', 3), ('cheese', 1), ('milk', 1), ('cookies', 4)] }</pre> <p>For every article there is a price per article and a quantity, i.e. the stock. The customers fill their carts, one after the other.</p> <p>Write a program to check if enough goods are available. Create a receipt for each customer with the following details:</p> <p>“quantity, name, unit_price, item_sum” in every row and the “total_sum” in the last row.</p>	15	CO4	KL3

12	<p>Let us consider polynomials in a single variable x with integer coefficients:</p> <p>for instance, $3x^4 - 17x^2 - 3x + 5$.</p> <p>Each term of the polynomial can be represented as a pair of integers (coefficient,exponent). The polynomial itself is then a list of such pairs.</p> <p>We have the following constraints to guarantee that each polynomial has a unique representation:</p> <ul style="list-style-type: none"> -- Terms are sorted in descending order of exponent. -- No term has a zero coefficient. -- No two terms have the same exponent. -- Exponents are always nonnegative. <p>For example, the polynomial introduced earlier is represented as $[(3,4), (-17,2), (-3,1), (5,0)]$.</p> <p>The zero polynomial, 0, is represented as the empty list $[]$, since it has no terms with nonzero coefficients.</p> <p>Write Python functions for the following operations:</p> <p>addpoly(p1,p2)</p> <p>multpoly(p1,p2)</p> <p>that <i>add</i> and <i>multiply</i> two polynomials, respectively.</p> <p>You may assume that the inputs to these functions follow the representation given above. Correspondingly, the outputs from these functions should also obey the same constraints.</p> <p>Some examples:</p> <ul style="list-style-type: none"> • addpoly([(4,3), (3,0)], [(-4,3), (2,1)]) <ul style="list-style-type: none"> ○ Output: [(2,1),(3,0)] <p>Explanation: $(4x^3 + 3) + (-4x^3 + 2x) = 2x + 3$</p> <ul style="list-style-type: none"> • addpoly([(2,1)], [(-2,1)]) <ul style="list-style-type: none"> ○ Output: [] <p>Explanation: $2x + (-2x) = 0$</p> <ul style="list-style-type: none"> • multpoly([(1,1), (-1,0)], [(1,2), (1,1), (1,0)]) <ul style="list-style-type: none"> ○ Output: [(1,3), (-1,0)] <p>Explanation: $(x - 1) * (x^2 + x + 1) = x^3 - 1$</p> <p>Hint: You are not restricted to writing just the two functions asked for. You can write auxiliary functions to "clean up" polynomials -- e.g., remove zero coefficient terms, combine like terms, sort by exponent etc. Build a library of small functions that can be combined to achieve the desired format.</p>	15	CO3	KL6
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KL – Bloom’s Taxonomy Levels

(KL1: Remembering, KL2: Understanding, KL3: Applying, KL4: Analyzing, KL5: Evaluating, KL6: Creating)

CO – Course Outcomes
